

# VERTICAL DROP TEST OF A SHORTS 3-30 AIRPLANE



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# TEST OBJECTIVE

Determine the impact response of the:

- Fuselage
- Seat tracks

of a high-wing commuter airplane, during a severe, but survivable, impact.

# SHORTS 3-30

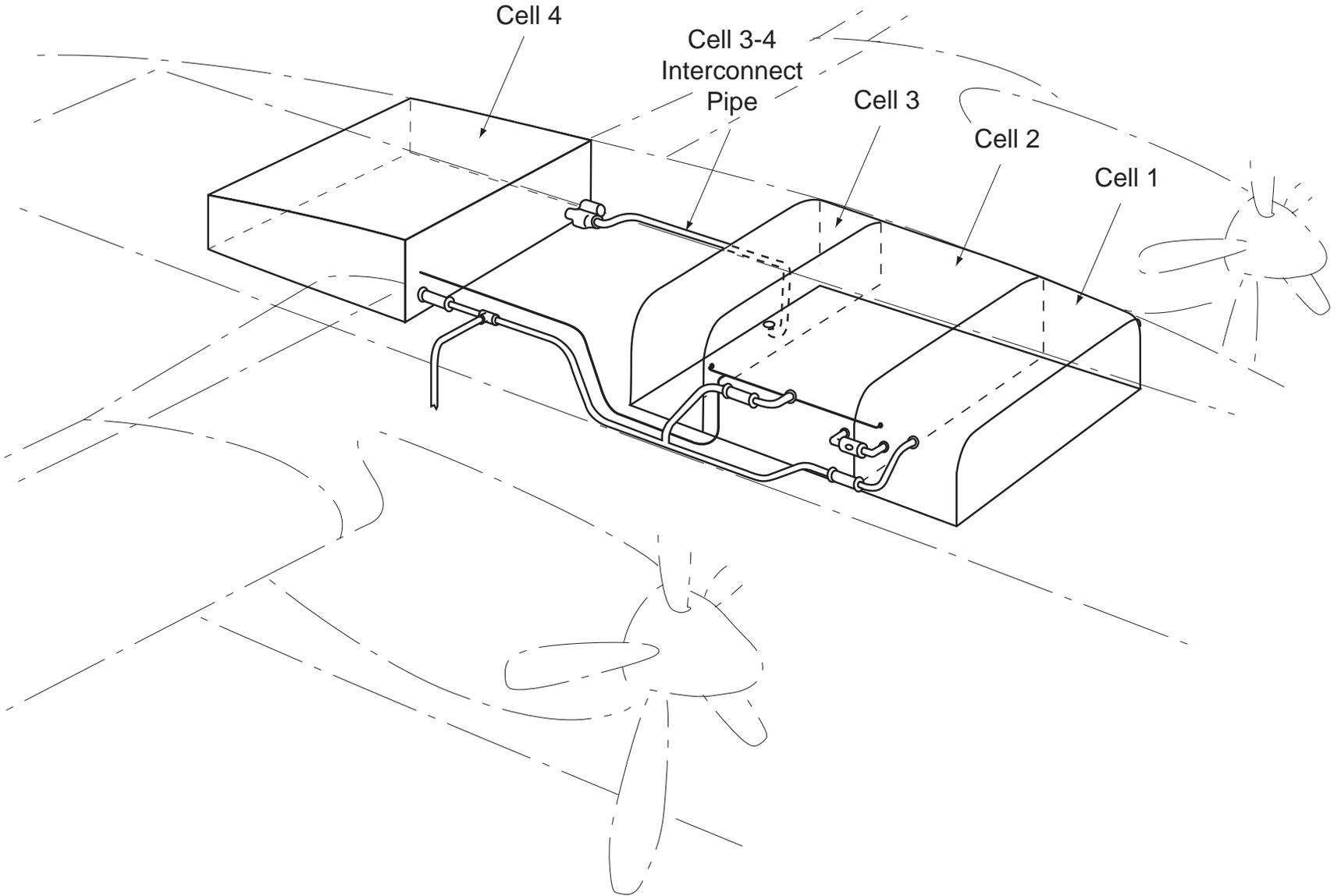
- 30 passenger regional transport
- Twin-turboprop
- High-wing design
- 58 feet long
- 75 foot wingspan
- Max takeoff weight 22,900 lbs



# TEST ARTICLE CONFIGURATION

- 26 Passengers + Crew
  - 7 anthropomorphic test dummies
  - 21 mannequins
- Interior furnishings removed
- Some control surfaces removed
  - flaps, elevators, ailerons
- No Landing gear
- Simulated fuel (3,875 lbs)
- Simulated engines
- Max luggage - Forward and AFT baggage compartments
- Weight 21,210 lbs

# FUEL SYSTEM CONFIGURATION



# VIDEO



# PRE-TEST

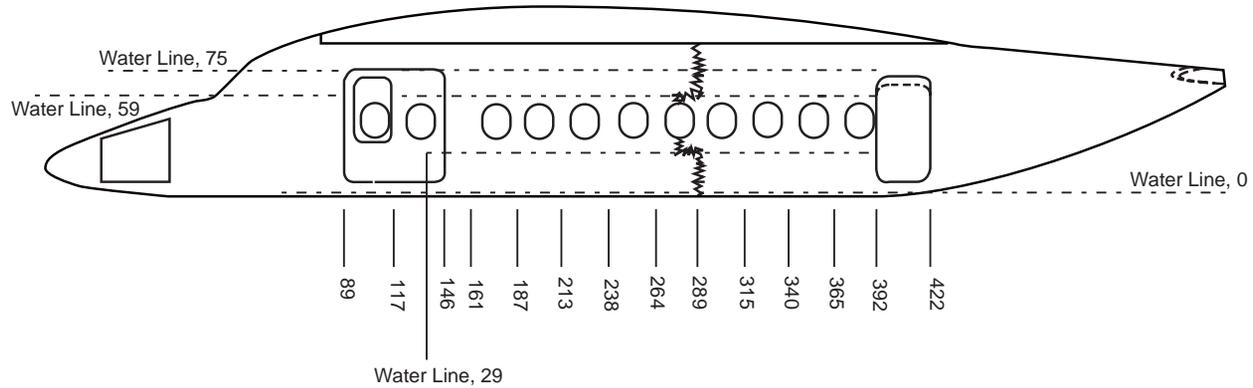


# POST-TEST

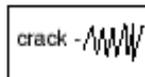
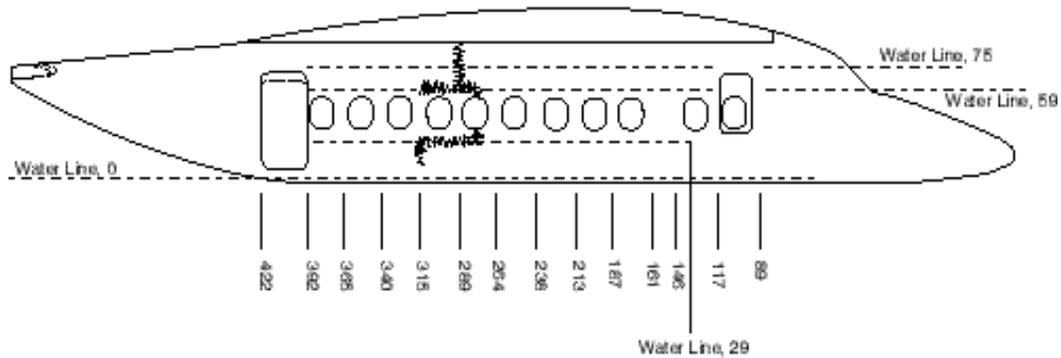


# POST-TEST

Pilot Side



Copilot Side



# SHORTS FUSELAGE TOP VIEW



# INTERIOR LOOKING AFT



# INTERIOR LOOKING FORWARD



# AFT CEILING DEFORMATION, L/S



# AFT CEILING DEFORMATION, R/S



# SEAT TRACKS AND FLOOR



# POST-TEST DATA

- 118 data channels
- Impact velocity 30 ft/s
- The airplane experienced 90 g's, with a pulse duration of 15 msec.
- The under floor crush measurements were approximately 0.1 inch.

# AFT FUEL TANK, R/S



# CELL 3-4 INTERCONNECT FITTING



# CRUSHED GRAVITY FEED OUTLET



# CONCLUDING REMARKS

- Fuselage impact velocity was 30 ft/sec.
- Airplane experienced 90g's, with a pulse duration of 15 msec.
- Very little lower fuselage deformation.
- Substantial upper fuselage damage.
- Seat tracks remained attached to the fuselage.

# CONCLUDING REMARKS

- Most passenger seats experienced structural failure.
- All exits remained operable.
- Numerous windows shattered.
- The overhead fuel tanks broke loose from their mountings, resulting in large quantities of simulated fuel being spilled onto the occupants.

